

**ENVIRONMENTAL ASSESSMENT  
GENERAL ELECTRIC COMPANY FOOD CONTACT NOTIFICATION**

1. **Date:** June 14, 2006
2. **Name of Applicant/Notifier:** General Electric Company
3. **Address:** 1 Noryl Avenue  
Selkirk, New York 12158

All communications on this matter are to be sent in care of Counsel for Notifier:  
Ralph A. Simmons, Partner  
Keller and Heckman LLP  
1001 G Street, N.W., Suite 500 West  
Washington, D.C. 20001  
Telephone: (202) 434-4120  
Facsimile: (202) 434-4646  
E-mail: [simmons@khlaw.com](mailto:simmons@khlaw.com)

4. **Description of the Proposed Action**

The action requested in this notification is to establish the clearance of the food-contact substance (FCS) that is referred to as , for use in the fabrication of food-contact articles. With the clearance of this Food-Contact Notification (FCN), the FCS will be used in contact with all food types under Conditions of Use A through H, as set forth in Tables 1 and 2, respectively, of 21 C.F.R. §176.170(c).

The subject resin offers several technical properties that make it useful in a variety of food-contact applications. In particular, it provides good strength and rigidity at elevated temperatures, long-term heat resistance, high dimensional stability, and excellent chemical resistance. Thus, while broad clearance, including single use food-contact applications, is being sought in this FCN, the primary food-contact applications in which the FCS will be used, from a practical standpoint, are repeated use food-contact applications, given the beneficial mechanical properties of the resin; this is in keeping with the broader class of polyphenylene oxide resins that are permitted for use in food-contact applications, *i.e.*, they, too, are used primarily in repeated-use applications even though they may be permitted to be used in contact with food more broadly.

The Notifier does not intend to produce finished food packaging from the subject resin. Rather, the resin will be sold to manufacturers engaged in the production of food-contact articles. Food-contact articles produced with the resin will be utilized in patterns corresponding to the national population density and will be widely distributed across the country. Therefore, it is anticipated that disposal of the subject resin will occur nationwide, with the material being land disposed, combusted, or recycled. According to the U.S. Environmental Protection Agency's 2001 update regarding municipal solid waste in the United States, 55.7% of municipal solid waste generally was land disposed, 14.7% was combusted, and 29.7% was recovered for recycling.<sup>1</sup>

The types of environments present at and adjacent to these disposal locations are the same as for the disposal of any other food-contact material in current use. Consequently, there are no special circumstances regarding the environment surrounding either the use or disposal of food-contact materials prepared from the resin.

**5. Identification of Substance that is the Subject of the Proposed Action**

The FCS that is the subject of this notification is a copolymer of 2,6-xylenol and 2,3,6-trimethylphenol (CAS Reg. No. 58295-79-7).

The resin is marketed under the trade name

**6. Introduction of Substances into the Environment**

Under 21 C.F.R. § 25.40(a), an environmental assessment ordinarily should focus on relevant environmental issues relating to the use and disposal from use, rather than the production, of FDA-regulated articles. Moreover, information available to the Notifier does not suggest that there are any extraordinary circumstances in this case indicative of any adverse environmental impact as a result of the manufacture of the resin. Consequently, information on the manufacturing site and compliance with relevant emissions requirements is not provided here.

No environmental release is expected upon the use of the subject resin to fabricate food-contact articles. In these applications, the resin is expected to be used as the basic polymer to fabricate all forms of food-contact articles, and will be entirely incorporated into the finished food-contact article. Any waste materials generated in this process, e.g., plant scraps, are expected to be disposed of as part of the packaging manufacturer's overall nonhazardous solid waste in accordance with established procedures.

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<sup>1</sup> *Characterization of Municipal Solid Waste in the United States: 2001 Update*, EPA 530-R-03-011, U.S. Environmental Protection Agency (5305W), Washington DC, 20460, October 2003.

Disposal by the ultimate consumer of food-contact articles produced from the subject resin will be by conventional rubbish disposal and, hence, primarily by sanitary landfill or incineration. The FCS is composed of carbon, hydrogen, and oxygen, elements that are commonly found in municipal solid waste. The proposed use of the FCS and the market volume (available in a confidential attachment to the FCN) show that 1) the FCS will make up a very small portion of the total municipal solid waste currently combusted (estimated to be 33 million tons or 14% of 236 million tons in 2003),<sup>2</sup> 2) the FCS will not significantly alter the emissions from properly operating municipal solid waste combustors,<sup>3</sup> and, therefore, 3) incineration of the FCS will not cause municipal solid waste combustors to threaten a violation of applicable emissions laws and regulations (40 C.F.R. Part 60 under/or relevant state and local laws).

Only extremely small amounts, if any, of the resin constituents are expected to enter the environment as a result of the landfill disposal of food-contact articles, in light of the Environmental Protection Agency's (EPA) regulations governing municipal solid waste landfills. EPA's regulations require new municipal solid-waste landfill units and lateral expansions of existing units to have composite liners and leachate collection systems to prevent leachate from entering ground and surface water, and to have ground-water monitoring systems. 40 C.F.R. Part 258. Although owners and operators of existing active municipal solid waste landfills that were constructed before October 9, 1993 are not required to retrofit liners and leachate collections systems, they are required to monitor groundwater and to take corrective action as appropriate. The lack of any leaching is especially true considering that the subject substances are high molecular weight polymers that contain only minute levels of extractable material even under conditions that greatly exaggerate environmental exposure conditions.<sup>4</sup>

## 7. Fate of Emitted Substances in the Environment

### (a) Air

No significant effect on the concentrations of and exposures to any substances in the atmosphere are anticipated due to the proposed use of the resin. The polymers are of high molecular weight and do not volatilize. Thus, no significant quantities of any substances will be released upon the use and disposal of food-contact articles manufactured with the resin.

As indicated above in item 6, the food-contact substance will make up a very small portion of the total municipal solid waste currently combusted, the food-contact substance will

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<sup>2</sup> U.S. EPA *Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2003*; EPA530-F-05-004; 2005.

<sup>3</sup> Paul M. Sullivan; Hallenbeck, W.H.; Brenniman, G.R. *Municipal Solid Waste Combustion*; University of Illinois at Chicago: Chicago, IL, 1993.

<sup>4</sup> This expectation is confirmed by the results of extraction studies described in the FCN. As shown there, when representative lots of the resin were extracted with either 10% ethanol, 3% acetic acid, or 50% ethanol at 121°C for 2 hours followed by 40°C for 10 days, minute levels of components of the subject resin were found in the extracts at levels ranging from non-detected at 6.99 parts per billion (ppb) to a maximum of 1.565 parts per million (ppm). Thus, the quantity of leachate from the resin in solid waste deposited in landfills will be extremely small.

not significantly alter the emissions from properly operating municipal solid waste combustors, and incineration of the food-contact substance will not cause municipal waste combustors to threaten a violation of applicable emissions laws and regulations.

**(b) Water**

No significant effects on the concentrations of and exposures to any substances in fresh water, estuarine, or marine ecosystems are anticipated due to the proposed use of the subject resin. No significant quantities of any substance will be added to these water systems upon the proper incineration of the polymers, nor upon its disposal in landfills due to the extremely low levels of aqueous migration of polymer components.

**(c) Land**

Considering the factors discussed above, no significant effects on the concentrations of and exposures to any substances in terrestrial ecosystems are anticipated as a result of the proposed use of the subject resin. In particular, the extremely low levels of maximum migration of components of the resin, demonstrated by the extraction studies, indicate that virtually no leaching of these substances may be expected to occur under normal environmental conditions when finished food-contact materials are disposed of. Furthermore, the low production of the resin for use in food-contact applications precludes any substantial release to the environment of their components. Thus, there is no expectation of any meaningful exposure of terrestrial organisms to these substances as a result of the proposed use of the resin.

Considering the foregoing, we respectfully submit that there is no reasonable expectation of a significant impact on the concentration of any substance in the environment due to the proposed use of the resin in the manufacture of articles intended for use in contact with food. Therefore, the environmental fate of substances does not need to be addressed due to the fact that no significant introduction of substances into the environment as a result of the proposed use of the FCS were identified as discussed under Format Item 6.

**8. Environmental Effects of Released Substances**

As discussed previously, the only substances that may be expected to be released to the environment upon the use and disposal of food-contact articles fabricated with the use of the resin consist of extremely small quantities of combustion products and extractables. As discussed in the FCN, the monomers from which the resin is manufactured are not considered to present a substantive genotoxicity or carcinogenicity risk at the minute levels at which they may enter the diet. Based on these considerations, no adverse effect on organisms in the environment is expected as a result of the disposal of articles containing the resin. In conclusion, no information need be provided on the environmental effects of substances released into the environment as a result of use and/or disposal of the FCS because, as discussed under Item 6, only extremely small quantities, if any, of substances will be introduced into the environment as a result of use and/or disposal of the FCS. Therefore, the use and disposal of the food additive

are not expected to threaten a violation of applicable laws and regulations, e.g., the Environmental Protection Agency's regulations in 40 CFR Parts 60 and 258.

#### **9. Use of Resources and Energy**

As is the case with other food-contact materials, the production, use and disposal of the resin involve the use of natural resources such as petroleum products, coal, and the like. However, the use of the subject resin in the fabrication of food-contact materials is not expected to result in a net increase in the use of energy and resources, since the resin is intended to be used in food-contact articles which will be used in place of similar materials now on the market for use in food-contact applications. Polymers currently used in the applications in which the [redacted] polymer is anticipated to be used include other polyphenylene oxide resins and other engineering thermoplastic resins, examples of which are available in a confidential attachment to the FCN. At this time, the [redacted] resin is intended to be used only in the manufacture of repeat use non food-contact articles, such as in blends with polyamide for automobile fenders and other exterior automobile parts, or in blends with polyamides or polystyrene that will be fabricated into medical trays. Thus, while there are no immediate applications involving contact with food at this time (as the polymer is not yet permitted for use in contact with food), it is anticipated that there may be food-contact applications for the [redacted] polymer in the future.

The replacement of other polyphenylene oxide resins and other engineering thermoplastic resins by the subject resin is not expected to have any adverse impact on the use of energy and resources. Manufacture of the resin, and its conversion to finished food-contact articles, will consume energy and resources in amounts comparable to the manufacture and use of the other polymers. While the clearance requested in this FCN involves use of the resin in any food-contact article, the food-contact applications in which the resin is most likely to be used in the future are repeated use applications; it is unlikely that the subject resin will be used to fabricate bottles or have any significant use in other single use food-contact applications, especially as polyphenylene oxide resins are much more expensive than the polymers currently used to fabricate single use food containers. (The specific technical and cost rationales to support this statement are set forth in a confidential attachment to the FCN.) For this reason, the subject resin is not expected to be used as a replacement for polyethylene terephthalate (PET) in soda bottles or high density polyethylene (HDPE) in milk bottles. As PET and HDPE bottles are the predominant food packaging articles recovered for recycling, and as [redacted] polymer will not be used in such applications, articles fabricated from the subject resin will be disposed of by means of sanitary landfill and incineration. Packaging materials produced from the resin are expected to be disposed of according to the same patterns when they are used in place of the current materials. Thus, there will be no impact on current or future recycling programs.

#### **10. Mitigation Measures**

As shown above, no significant adverse environmental impacts are expected to result from the use and disposal of food-contact materials fabricated from the subject resin. This is primarily due to the minute levels of leaching of potential migrants from finished food-contact

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articles, the insignificant impact on environmental concentrations of combustion products of the resin, and the insignificant impact on the use of resources and energy when compared with the materials they are intended to replace. Thus, the use of the resin as proposed is not reasonably expected to result in any new environmental problem requiring mitigation measures of any kind.

11. **Alternatives to the Proposed Action**

No potential adverse environmental effects are identified herein that would necessitate alternative actions to those proposed in this Notification. The alternative of not approving the action proposed herein would simply result in the continued use of the materials that the subject resin would otherwise replace; such action would have no environmental impact. In view of the fact that the resin components are not expected to enter the environment in more than minute quantities upon the use and disposal of finished food-contact articles, and the absence of any significant environmental impact which would result from their use, the establishment of an effective Food Contact Notification to permit the use of the subject resin as described herein is environmentally safe in every respect.

12. **List of Preparers**

Ralph A. Simmons, Attorney, Keller and Heckman LLP, 1001 G Street, N.W., Suite 500 West, Washington, D.C. 20001.

Lester Borodinsky, Staff Scientist, Keller and Heckman LLP, 1001 G Street, N.W., Suite 500 West, Washington, D.C. 20001.

13. **Certification**

The undersigned official certifies that the information provided herein is true, accurate, and complete to the best of his knowledge.

Date: June 14, 2006



Ralph A. Simmons  
Counsel for General Electric Company